

## Montana Board of Oil and Gas Conservation Environmental Assessment

**Operator:** Samson Resources Company  
**Well Name/Number:** Riva Ridge 6-7-33-56H  
**Location:** NW NE 6 T33N R56E  
**County:** Sheridan, MT; Field (or Wildcat) Wildcat

### Air Quality

(possible concerns)

Long drilling time: No, 30-40 days drilling time.

Unusually deep drilling (high horsepower rig): Triple derrick rig 18,199' MD/8,443' TVD Three Forks Formation, a single lateral horizontal well test.

Possible H<sub>2</sub>S gas production: Slight chance H<sub>2</sub>S gas production.

In/near Class I air quality area: Yes, closest Class I air quality area is the Fort Peck Indian Reservation, about 1 mile to the southwest from this location.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: \_\_\_\_\_

Comments: Associated gas to be flared or if a gas pipeline is run to a gathering facility then it can be hooked up.

### Water Quality

(possible concerns)

Salt/oil based mud: Yes to intermediate casing string hole, oil based invert drilling fluids. Horizontal lateral will be drilled with oil based invert drilling fluids. Surface casing will be drilled with freshwater and freshwater mud system.

High water table: Possible high water table.

Surface drainage leads to live water: Yes, closest live water is Big Muddy Creek, about ¼ of a mile to the southwest from this location.

Water well contamination: None, closest water wells in the area are about 5/8 of a mile to the southwest, ¾ of a mile to the east, ¾ of a mile to the west and all other wells are 1 mile and further from this location. Depth of these wells range from 80' to 380', significantly shallower than the surface casing setting depth of 1100'. Surface casing hole will be drilled with freshwater and freshwater drilling fluids. Steel surface casing will be run and cemented to surface from 1100'.

Porous/permeable soils: Yes, sandy silty clay soils.

Class I stream drainage: No, Class I stream drainages nearby.

Mitigation:

☐ Lined reserve pit

☒ Adequate surface casing

☐ Berms/dykes, re-routed drainage

☒ Closed mud system

☐ Off-site disposal of solids/liquids (in approved facility)

☒ Other: Offsite disposal pit for cuttings on existing surface owners property. If suitable pit site is not found cuttings will be hauled to the Plentywood landfill or a commercial disposal site.

Comments: 1100' surface casing well below freshwater zones in adjacent water wells. Also, covering the Fox Hills aquifer. Adequate surface casing and BOP equipment to prevent problems.

### Soils/Vegetation/Land Use

(possible concerns)

Steam crossings: None anticipated.

High erosion potential: No, location will require a small cut of up to 6.21' and small fill, up to 3.0', required.

Loss of soil productivity: None, location to be restored after drilling well, if nonproductive. If productive unused portion of wellsite will be reclaimed.

Unusually large wellsite: No, very large well site 515'X470'.

Damage to improvements: Slight, surface use is cultivated land.

Conflict with existing land use/values: Slight

Mitigation

☐ Avoid improvements (topographic tolerance)

☐ Exception location requested

☒ Stockpile topsoil

☐ Stream Crossing Permit (other agency review)

☒ Reclaim unused part of wellsite if productive

☐ Special construction methods to enhance reclamation

☒ Other Requires DEQ General Permit for Storm Water Discharge Associated with Construction Activity, under ARM 17.30.1102(28)

Comments: Will use existing State Highway #16. About 575' of new access road will be built into this location from the existing State Highway #16. Cuttings will be buried in the lined offsite pit or hauled to a commercial disposal if a suitable offsite pit is not found. Oil base invert drilling fluids will be recycled. Completion fluids will be removed and hauled to commercial Class II Disposal. The cuttings pit will be covered with subsoil if well is productive. If well is not productive subsoil will be spread and topsoil will be spread on top of the subsoil. No concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Residences about 1/2 of a mile to the north, about 7/8 of a mile to the southwest and about 1.25 miles to the east northeast from this location. Town of Antelope, Montana is about 3 miles to the north northwest and the town of Reserve, Montana is about 3.125 miles to the southwest from this location.

Possibility of H2S: Slight chance of H2S.

Size of rig/length of drilling time: Triple drilling rig 30 to 40 days drilling time.

Mitigation:

☒ Proper BOP equipment

☐ Topographic sound barriers

☐ H2S contingency and/or evacuation plan

☐ Special equipment/procedures requirements

☐ Other \_\_\_\_\_

Comments: Adequate surface casing cemented to surface with operational 5000 psi double ram and annular BOP stack should mitigate any problems. Sufficient distance between location and buildings noise should not be a problem.

### Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Whooping Crane and Piping Plover. Candidate species is the Sprague's Pipit. MTFWP Natural Heritage Tracker website indicates one (1) species of concern, the Whooping Crane.

Mitigation:

- ☐ Avoidance (topographic tolerance/exception)
- ☐ Other agency review (DFWP, federal agencies, DSL)
- ☐ Screening/fencing of pits, drillsite
- ☐ Other: \_\_\_\_\_

Comments: Private surface cultivated land. There maybe species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

### Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites: None identified.

Mitigation

- ☐ avoidance (topographic tolerance, location exception)
- ☐ other agency review (SHPO, DSL, federal agencies)
- ☐ Other: \_\_\_\_\_

Comments: Surface location is private cultivated land. There maybe possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

### Social/Economic

(possible concerns)

- ☐ Substantial effect on tax base
- ☐ Create demand for new governmental services
- ☐ Population increase or relocation

Comments: Wildcat Bakken Formation horizontal well. No concerns.

### Remarks or Special Concerns for this site

Drill a 18,199' MD/8,443' TVD Three Forks Formation, a single lateral horizontal well test.  
No concerns.

### Summary: Evaluation of Impacts and Cumulative effects

Short term impacts expected, no long term impacts anticipated.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Steven Sasaki

(title:) Chief Field Inspector

Date: December 19, 2011

Other Persons Contacted:

Montana Bureau of Mines and Geology, Groundwater Information Center GWIC  
website

(Name and Agency)

Sheridan County water wells

(subject discussed)

November 5, 2011

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA  
COUNTIES, Sheridan County

(subject discussed)

November 5, 2011

(date)

Montana Natural Heritage Program Website (FWP)

(Name and Agency)

Heritage State Rank= S1, S2, S3, T33N R56E

(subject discussed)

November 5, 2011

(date)

If location was inspected before permit approval:

Inspection date: \_\_\_\_\_

Inspector: \_\_\_\_\_

Others present during inspection: \_\_\_\_\_